RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH

SUBJECT TITLE : IVORY

PERIOD COVERED : April - June 1990

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KEYWORDS : ivory-coast, senegal, taste, shipping, bbs, temperature, tracer, record, case, container, bacteria

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## OBJECTIVES

- Investigate the reasons for subjective differences in ML cigarettes produced in Ivory Coast (Bouake) and Senegal (Dakar) from the same Basic Blend Strips (BBS) shipped from Richmond.
- Monitor BBS shipment and storage conditions from production to processing in respective primaries.
- Study the impact of local tobacco processing on microbiological and chemical composition as well as subjective quality of final products.

## STATUS

Tobacco temperature was recorded during BBS shipment and storage for both destinations.
Microbial situations were profiled before and after shipment and storage as well as during tobacco processing in respective factories.

## RESULTS

### Temperature

Tobacco sample cases with temperature recorders were loaded in bottom, middle and top of 40 containers [1].
For both destinations, temperature profiles can be divided into four parts : storage between BBS production and loading of containers, shipment between USA and destination port, transfer from port to factory warehouse, and storage in warehouse until trial lay down [2].
Figs. 1 and 2 present BBS temperature profiles in cases from

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middle and top of the containers for Ivory Coast and Senegal.
After BBS production, tobacco temperature decreased from 35-40°C to 20°C before shipment. During shipment, tobacco temperature varied only slightly for the cases in the middle of the containers. Temperature variations however were observed in cases on the top. More particularly for Ivory Coast, temperature increased from 20 to 30°C and day/night cycles were recorded. As containers were unloaded and stored in Abidjan for two weeks, the amplitude of daily variations reached 7°C.
In Senegal factory warehouses, tobacco temperature varied from 25 to 20°C and then back to 25°C within the three months' storage. The overall temperature in Ivory Coast warehouses remained relatively constant around 30°C, but cyclic variations were still recorded.

Microbiology

Figs. 3 and 4 summarize microbiological situations during both BBS shipments.
Total bacterial counts (CFU = Colony Forming Units) were around 1.4 x 10e6 per gram BBS after production in Richmond. The population was reduced by more than half (0.6 x 10e6) during shipments. This reduction continued during storage in local warehouses as well as during tobacco processing, to finally reach a total bacterial count of 0.5 x 10e5 in the final cut fillers. The bacterial population of BBS after production was reduced by a factor of 30 during shipment, storage and cigarette manufacturing in Senegal and Ivory Coast. The proportion of dormant spores remained relatively constant throughout the tests at around 60%. No significant differences could be found between samples taken from cases loaded in the bottom, middle or top of the containers.

## CONCLUSIONS

Temperature differences were observed between BBS shipments to Ivory Coast and Senegal. Day/night variations were recorded during the Ivory Coast shipment and storage in Abidjan port for cases loaded at the containers' edge.
During the storage in factory warehouses, daily temperature variations were also measured in Ivory Coast and the average temperature was 5°C above that of Senegal.
Tobacco microbiology was similar during both tests, with a drastic reduction of the bacterial population.

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## PLANS

A final report including results from subjective evaluations is in preparation.

## REFERENCES

[1] Memo from Roer-W. to Butticaz-B., August 16, 1989.
[2] Profs note from Roer-W. to Berney-J., May 22, 1990.

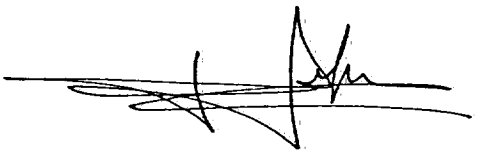

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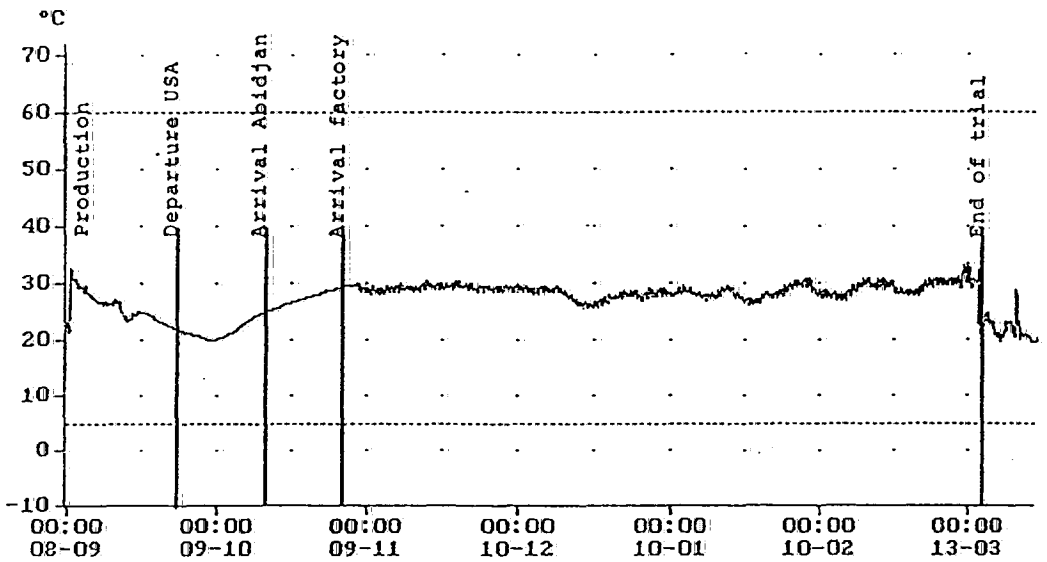
Figure 1 : BBS TEMPERATURE PROFILE
IVORY COAST

Middle




Time – Date

Top

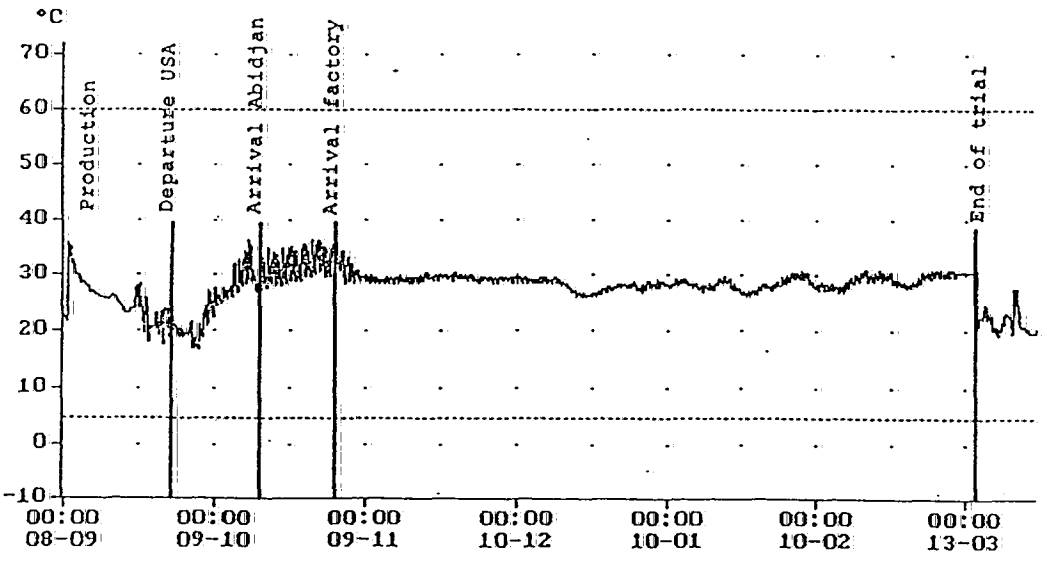



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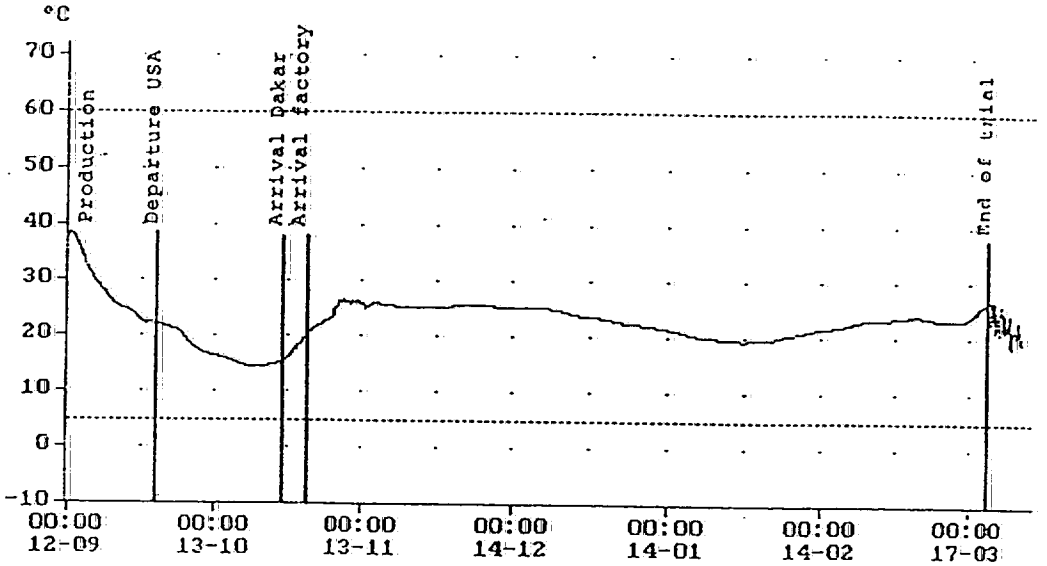
Figure 2 : BBS TEMPERATURE PROFILE
SENEGAL

Middle

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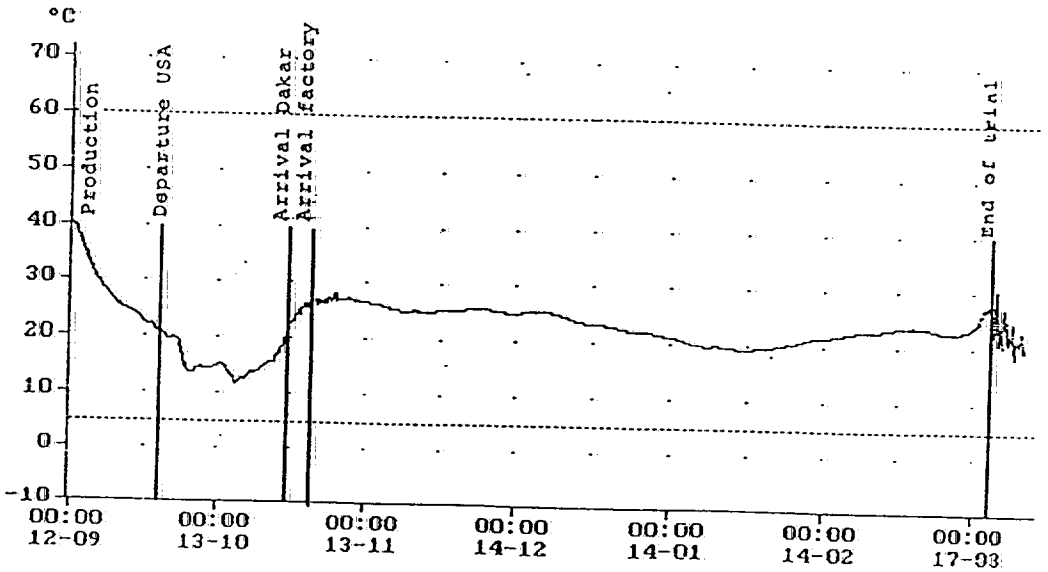


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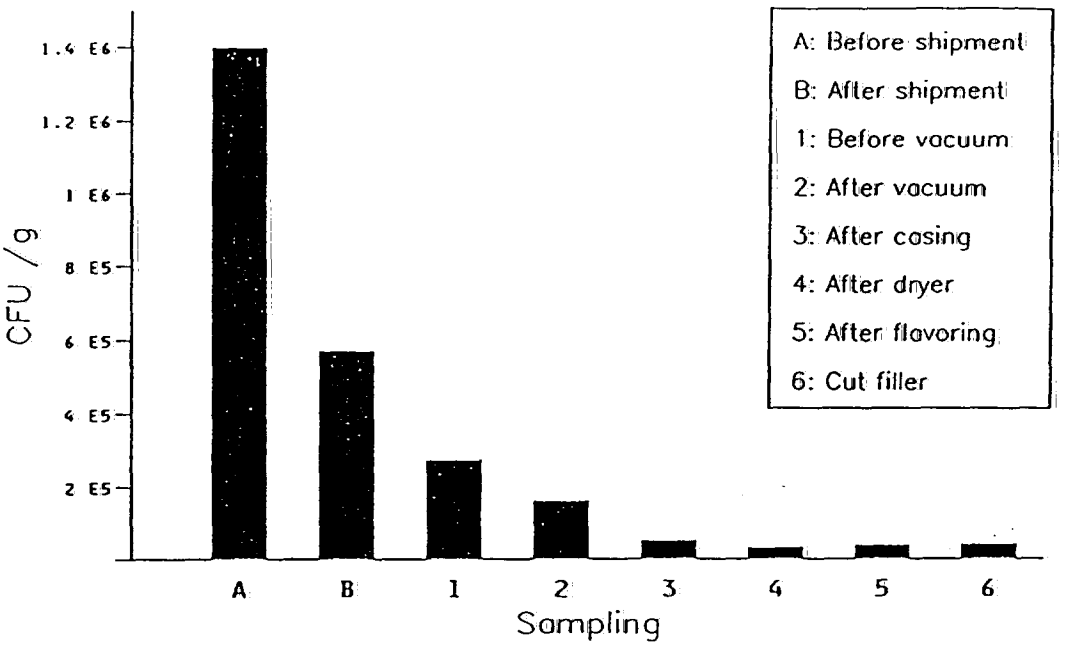
Figure 3 : BBS SHIPMENT IN IVORY COAST
Total Bacterial Count




BBS SHIPMENT IN IVORY COAST
Dormant Spore Proportion

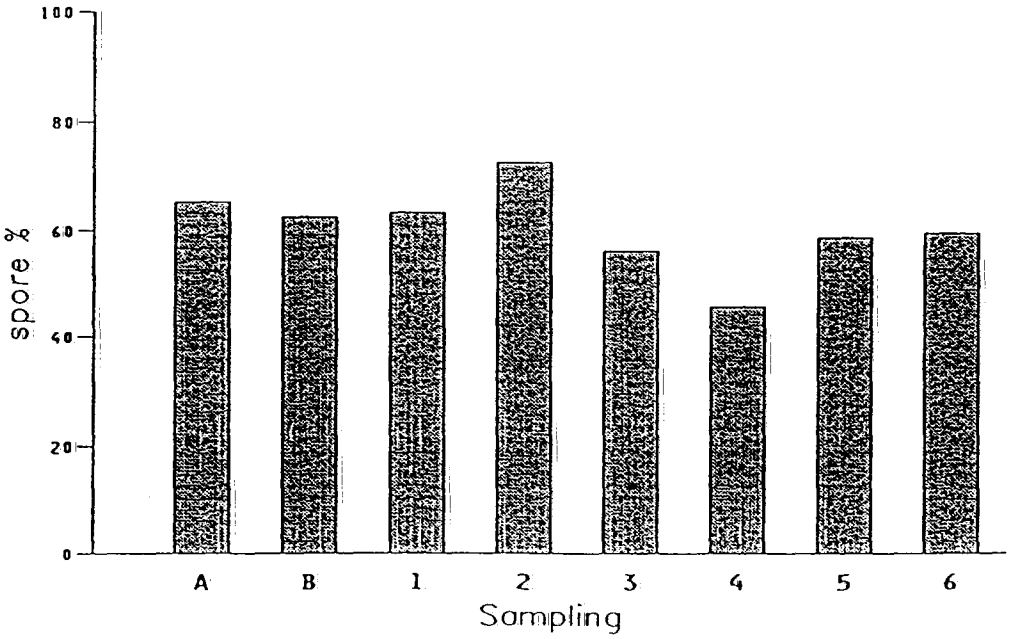



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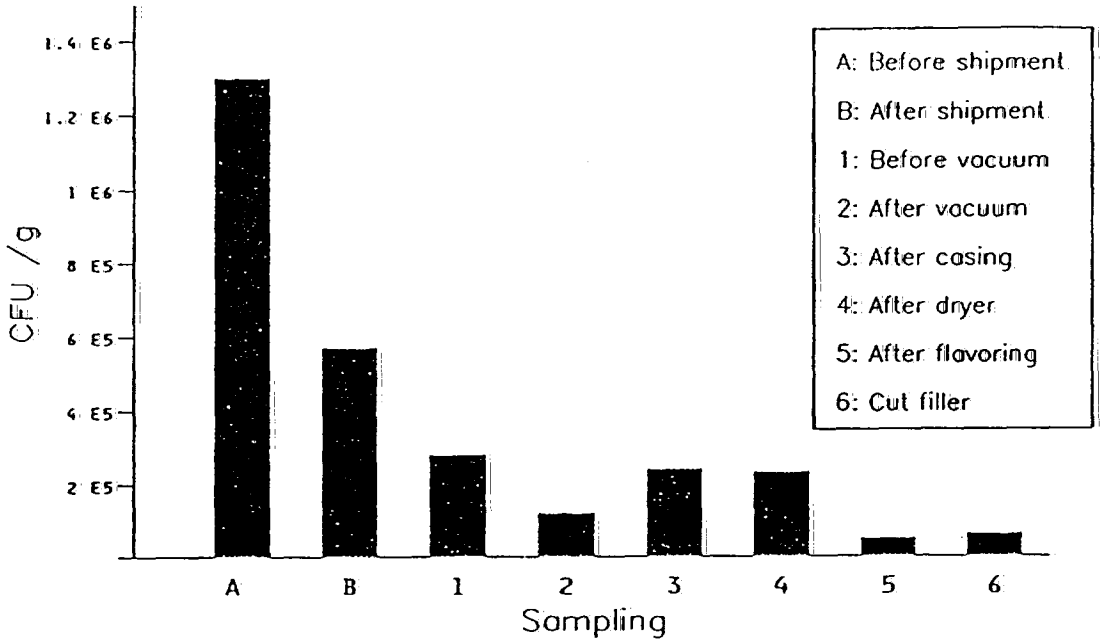
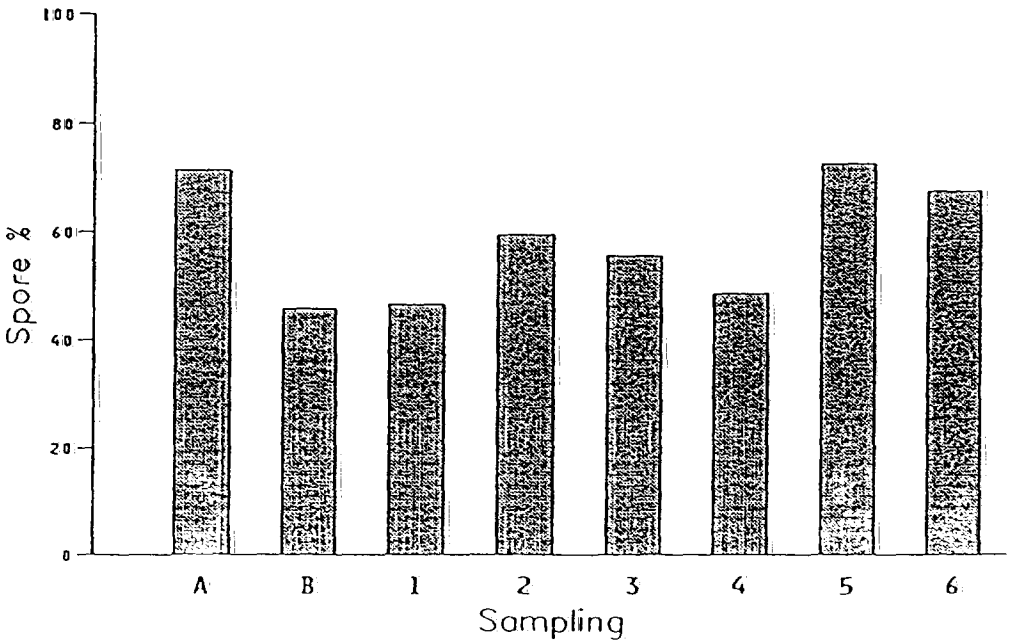
Figure 4 : BBS SHIPMENT IN SENEGAL
Total Bacterial Count




BBS SHIPMENT IN SENEGAL
Dormant Spore Proportion

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